

Abstract of the Disclosure

A class of material having barium, cadmium, and tantalum provides high dielectric constant and low loss for use in electronic and optical applications. The material may also contain an element with valence 2 such as magnesium and zinc. Transition metal dopants can also be added to reduce annealing time and/or to tune the temperature-coefficient of resonant frequency. The dielectric material can be made in ceramic or thin film form. The process begins with a mixture of barium carbonate, zinc oxide, tantalum oxide, and cadmium oxide blended together. The slurry is dried and heated. A sintering agent is added to produce high-density samples. The resulting slurry is dried and an adhesive is added to press the mixture into a solid ceramic samples. Thin film dielectric material is made with a thin film growth technique, such as by exposing the mixture to a laser and growing the material on a substrate.